

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A fuel cell system comprising:

a fuel cell configured to generate ~~for generating~~ power from fuel gas supplied thereto;
a supply system configured to supply ~~for supplying~~ fuel gas to the fuel cell;
a recirculation system configured to recirculate ~~for recirculating~~ unused fuel gas from the fuel cell, wherein fuel gas in the recirculation system contains ~~containing~~ nitrogen;

a purge valve configured to purge ~~for purging~~ nitrogen contained in the fuel gas in the recirculation system, wherein the purge valve is configured such that a valve opening degree of the purge valve is controlled to be reduced or increased; and

a controller configured to adjust the ~~for adjusting~~ a valve opening degree of the purge valve such that a nitrogen concentration of the fuel gas in the recirculation system is controlled to be maintained at a target nitrogen concentration,

wherein the controller is configured ~~adapted~~ to:

adjust the valve opening degree of the purge valve to maintain a flow rate of fuel in a fuel gas passing through the purge valve at a threshold set in accordance with operation conditions of the fuel cell system and the valve opening degree of the purge valve, by reducing the valve opening degree of the purge valve if the flow rate of fuel in the fuel gas passing through the purge valve is more than the threshold, and increasing the valve opening degree of the purge valve if the flow rate of the fuel gas passing through the purge valve is less than the threshold.

2. (Canceled)

3. (Currently Amended) The fuel cell system according to claim 1, wherein the threshold is set larger as the valve opening degree of the purge valve becomes larger.

4. (Currently Amended) The fuel cell system according to claim 1, further comprising:
a temperature sensor configured to detect a ~~for detecting~~ temperature of the fuel gas passing through the purge valve, wherein the threshold is set lower as the temperature of the fuel gas detected by the temperature sensor rises.
5. (Currently Amended) The fuel cell system according to claim 1, further comprising:
a pressure sensor configured to detect a ~~for detecting~~ pressure of fuel gas in the supply system, wherein the threshold is set lower as the pressure of the fuel gas detected by the pressure sensor drops.
6. (Previously Presented) The fuel cell system according to claim 1, wherein the flow rate of fuel in the fuel gas passing through the purge valve is obtained from a difference between a supply rate of fuel supplied from the supply system and a consumption rate of fuel gas consumed by the fuel cell.
7. (Currently Amended) The fuel cell system according to claim 6, further comprising:
an ejector provided in the recirculation system, to which the supply system is connected; and
a pressure sensor configured to detect ~~for detecting~~ a supply pressure of fuel gas supplied to the ejector,
wherein the supply rate of fuel supplied from the supply system is calculated based on the supply pressure detected by the pressure sensor.
8. (Currently Amended) The fuel cell system according to claim 7, further comprising:
a temperature sensor configured to detect ~~for detecting~~ a temperature of fuel gas upstream of the ejector, wherein the supply rate of fuel is calculated based on the temperature of the fuel gas detected by the temperature sensor and the supply pressure thereof detected by the pressure sensor.
9. (Currently Amended) The fuel cell system according to claim 6, further comprising:
a fuel pressure regulator for the fuel gas supplied to the fuel cell;
a valve opening sensor configured to detect ~~for detecting~~ a valve opening of the fuel pressure regulator; and

a pressure sensor configured to detect ~~for detecting~~ pressure of fuel gas upstream of the fuel pressure regulator, wherein the supply rate of fuel is calculated based on the valve opening of the fuel pressure regulator detected by the valve opening sensor, and the pressure of the fuel gas upstream of the fuel pressure regulator detected by the pressure sensor.

10. (Currently Amended) The fuel cell system according to claim 9, further comprising:

a temperature sensor configured to detect a ~~for detecting~~ temperature of the fuel gas upstream of the fuel pressure regulator, wherein the supply rate of fuel is calculated based on a valve opening degree of the fuel pressure regulator detected by the valve opening sensor, the pressure of the fuel gas upstream of the fuel pressure regulator detected by the pressure sensor, and the temperature of the fuel gas detected by the temperature sensor.

11. (Currently Amended) The fuel cell system according to claim 6, further comprising:

an ammeter configured to detect ~~for detecting~~ an output current of the fuel cell, wherein the consumption rate of fuel is calculated based on the output current detected by the ammeter.

12. (Currently Amended) The fuel cell system according to claim 6, further comprising:

an ammeter configured to detect ~~for detecting~~ an output current of the fuel cell; and
a pressure sensor configured to detect a ~~for detecting~~ pressure of fuel gas upstream or downstream of the fuel cell, wherein the controller is provided with a unit for obtaining a variation rate of the pressure of the fuel gas detected by the pressure sensor, and wherein the consumption rate of fuel is calculated based on the output current detected by the ammeter and the variation rate of the pressure of the fuel gas given by the unit of the controller.

13. (Withdrawn - Currently Amended) A method for controlling a fuel cell system comprising:

supplying fuel gas to a fuel cell;
re-circulating unused fuel gas from the fuel cell by a recirculation system, fuel gas in the recirculation system containing nitrogen;
purging nitrogen by a purge valve; and

using a controller, adjusting a valve opening degree of the purge valve to maintain a rate of flow of fuel in a fuel gas passing through the purge valve at a threshold set in accordance with operation conditions of the fuel cell system and the valve opening degree of the purge valve so as to keep a nitrogen concentration of the fuel gas in the recirculation system constant by reducing the valve opening degree of the purge valve if the rate of flow of fuel in the fuel gas passing through the purge valve is more than the threshold, and increasing the valve opening degree of the purge valve if the rate of flow of fuel in the fuel gas passing through the purge valve is less than the threshold.

14. (Currently Amended) A fuel cell system comprising:

- a fuel cell configured to generate ~~for generating~~ power from fuel gas supplied thereto;
- a supply system configured to supply ~~for supplying~~ fuel gas to the fuel cell;
- a recirculation system configured to recirculate ~~for recirculating~~ unused fuel gas from the fuel cell, wherein fuel gas in the recirculation system contains ~~containing~~ nitrogen;
- a purge valve configured to purge ~~for purging~~ nitrogen contained in the fuel gas in the recirculation system, wherein the purge valve is configured such that a valve opening degree of the purge valve is controlled to be reduced or increased; and
- a controller configured to adjust the ~~for adjusting~~ a valve opening degree of the purge valve such that a nitrogen concentration of the fuel gas in the recirculation system is controlled to be maintained at a target nitrogen concentration.

15. (Currently Amended) The fuel cell system according to claim 14, wherein the controller is configured ~~adapted~~ to:

- reduce the valve opening degree of the purge valve if the flow rate of fuel in the fuel gas passing through the purge valve is more than a threshold set in accordance with operating conditions of the fuel cell system and the valve opening degree of the purge valve, and
- increase the valve opening degree of the purge valve if the flow rate of the fuel gas passing through the purge valve is less than the threshold.

16. (Currently Amended) The fuel cell system according to claim 15, wherein the threshold is set larger as the valve opening degree of the purge valve becomes larger.

17. (Currently Amended) The fuel cell system according to claim 15, further comprising:
a temperature sensor configured to detect a ~~for detecting~~ temperature of the fuel gas passing through the purge valve, wherein the threshold is set lower as the temperature of the fuel gas detected by the temperature sensor rises.
18. (Currently Amended) The fuel cell system according to claim 15, further comprising:
a pressure sensor configured to detect a ~~for detecting~~ pressure of fuel gas in the supply system, wherein the threshold is set lower as the pressure of the fuel gas detected by the pressure sensor drops.
19. (Previously Presented) The fuel cell system according to claim 14, wherein the flow rate of fuel in the fuel gas passing through the purge valve is obtained from a difference between a supply rate of fuel supplied from the supply system and a consumption rate of fuel gas consumed by the fuel cell.
20. (Currently Amended) The fuel cell system according to claim 19, further comprising:
an ejector provided in the recirculation system, to which the supply system is connected; and
a pressure sensor configured to detect ~~for detecting~~ a supply pressure of fuel gas supplied to the ejector, wherein the supply rate of fuel supplied from the supply system is calculated based on the supply pressure detected by the pressure sensor.
21. (Currently Amended) The fuel cell system according to claim 20, further comprising:
a temperature sensor configured to detect ~~for detecting~~ a temperature of fuel gas upstream of the ejector, wherein the supply rate of fuel is calculated based on the temperature of the fuel gas detected by the temperature sensor and the supply pressure thereof detected by the pressure sensor.
22. (Currently Amended) The fuel cell system according to claim 19, further comprising:
a fuel pressure regulator for the fuel gas supplied to the fuel cell;
a valve opening sensor configured to detect ~~for detecting~~ a valve opening of the fuel pressure regulator; and

a pressure sensor configured to detect a ~~for detecting~~ pressure of fuel gas upstream of the fuel pressure regulator, wherein the supply rate of fuel is calculated based on the valve opening of the fuel pressure regulator detected by the valve opening sensor, and the pressure of the fuel gas upstream of the fuel pressure regulator detected by the pressure sensor.

23. (Currently Amended) The fuel cell system according to claim 22, further comprising:

a temperature sensor configured to detect a ~~for detecting~~ temperature of the fuel gas upstream of the fuel pressure regulator, wherein the supply rate of fuel is calculated based on a valve opening degree of the fuel pressure regulator detected by the valve opening sensor, the pressure of the fuel gas upstream of the fuel pressure regulator detected by the pressure sensor, and the temperature of the fuel gas detected by the temperature sensor.

24. (Currently Amended) The fuel cell system according to claim 19, further comprising:

an ammeter configured to detect ~~for detecting~~ an output current of the fuel cell, wherein the consumption rate of fuel is calculated based on the output current detected by the ammeter.

25. (Currently Amended) The fuel cell system according to claim 19, further comprising:

an ammeter configured to detect ~~for detecting~~ an output current of the fuel cell; and
a pressure sensor configured to detect a ~~for detecting~~ pressure of fuel gas upstream or downstream of the fuel cell, wherein the controller is provided with a unit for obtaining a variation rate of the pressure of the fuel gas detected by the pressure sensor, and wherein the consumption rate of fuel is calculated based on the output current detected by the ammeter and the variation rate of the pressure of the fuel gas given by the unit of the controller.